

chi sq - test:

It tell about Population propartion. It's non parametric test that is performed on categorical data.

Ex -

Consider below 2000 Vs census for population.

<18yr	(18-35)yr	>35yr
20%	30%	50%

Consider 2010 population census.

<18yr	(18-35)yr	>35yr
121	286	91

Using $\alpha = 0.5$ would yo conclude the Population distribution of age has changed in the last 10 yrs.

Table based on above observations:

		<18 yr	(18-35)yr	>35 yr
2000	Initial	20%	30%	50%
2010	Observed	121	286	91
2000	Initial a/q n = 500	100	150	250

a) Null Hypothesis

└ Data meet expected distribution
of 2010 (H_0)

Alternate Hypothesis

└ Data do not meet expected
distribution of 2010 (H_1)

b) $\alpha = 0.05$, C.I = 95%.

degree of freedom = $n - 1$

= 2 [$n = 3$ as no of
category.]

From chi-sq table for $\alpha = 0.05$ and
degree of freedom = 2

st. deviation = 5.991

Chi-sq test:

$$= \chi^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$

$$= \frac{(121-100)^2}{100} + \frac{(286-150)^2}{150} + \frac{(91-250)^2}{250}$$

$$= \frac{21^2}{100} + \frac{136^2}{150} + \frac{(-159)^2}{250}$$

$$= \frac{441}{100} + \frac{18496}{150} + \frac{25281}{250}$$

$$= 4.41 + 123.3 + 101.12$$

$$= 228.83$$

Conclusion,

$$\chi^2 > 5.99$$

Thus, we reject the null hypothesis
means the distribution has changed.

Anova test

It's a type of statistical test used
to determine if there is a statistically
significance diff b/w two or more categorical
groups.

Assumptions of Anova:

- An Anova can only be conducted if there is no relationship b/w the subjects in each sample.
- Different groups must have equal sample size.
- An Anova can be conducted if the dependent variable is normally distributed.

Types of Anova test:

- One way Anova test
- Two way Anova test.

One way Anova test:

One way Anova has one categorical independent variable and a normally distributed continuous dependent variable.

Independent variable divides cases into two or more mutually exclusive levels, categories or groups.

Two way Anova test:

Two way Anova has two or more categorical independent variables and a normally distributed continuous dependent variable.

Independent variables divide cases into two or more mutually exclusive levels, categories or groups. Two way Anova is also called factorial Anova.